History of Women: Women's Contribution to Aviation

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Abstract

Women's contributions to aviation have been long overlooked. Since the early days of aviation, women have been active participants in aviation. Opportunities for women in aviation did not come easily; they were based on decades of struggle, determination, and perseverance.

This paper explores some of the key contributions of early aviatrixes in the United States. Women made indispensible contributions to aviation throughout the history of flight. Although there are many more women all over the world involved in aviation, this study focuses on aviatrixes in the United States. The contributions of these aviatrixes are being researched more and more and this data is finally filtering to the public.

Introduction

Since the first "manned" flight on December 17, 1903, the arena of flight has almost exclusively consisted of men pilots and, consequently, men aviation educators. Even today, women constitute a very small percentage of the flying realm, including the educational field of aviation.

There has been little written on contemporary American women in aviation. Likewise, documentation of the pioneering efforts of male pilots is much easier to find than female contributions. As Holden discovered, the reasons why consist of attitude and economics. These factors still operate to a certain extent today[1].

The history of women in aviation epitomizes significant contributions too numerous to detail within the scope of this study. However, if women had been fully admitted into the field of aviation, the achievements they could have realized are especially apparent among the ranks of pilots and those who educate pilots. For women in aviation throughout the world, the pioneer spirit remains strong. The words of the famous aviatrix Jacqueline Cochran take on added significance since they were written almost forty years ago:

> Earthbound souls know only that underside of the atmosphere in which they live…but go higher up—above the dust and water vapor—and the sky turns dark and, up high enough, one can see the stars at noon. I have[2].

Background Literature

Since the early days of aviation, women have been active participants in aviation and aviation education. Opportunities for women in aviation did not come easily. They were based on

[1]Henry M. Holden and Captain L. Griffith, *Ladybirds: The Untold Story of Women Pilots in America*, revised 2nd printing ed. (Mt. Freedom, NJ: Black Hawk Publishing Co., 1992).

[2] Jacqueline Cochran, *The Stars at Noon* (Boston: Little, Brown, 1954).

decades of struggle, determination, and perseverance. One of the most famous figures in aviation history is Amelia Earhart. She won early acclaim by becoming the first woman to fly across the Atlantic in 1928; however, her success was marred by the fact that two male pilots had actually been at the controls throughout the flight, even though she was a qualified pilot. Earhart compensated for this by achieving many record-breaking flights and she eventually flew solo across the Atlantic in May, 1932. She was lost at sea while attempting to fly around the world in 1937[3].

A year later, another women pilot, Lores Bonney, flew solo from Brisbane, Australia, to London—about five times as far as Earhart's trip across the Atlantic. Because she was not trying for a speed record and she did not have as good a publicist as Earhart, her flight was unacclaimed and forgotten over time. There was little notice taken of her remarkable feat; this may have been because of the culture of the day and believed a woman's place was "in the home"[4].

Women like Amelia Earhart and Jacqueline Cochran were highly visible and continually earned kudos and criticism, but most women in early aviation posed an economic threat to the men. Any failure was used to prove they were physically and emotionally unfit for flying. Ironically, if they survived an accident, it was used to show that air travel was safe[5].

Women have been active in aviation and aviation education since the beginning of flight. Katherine Wright, sister of Orville and Wilbur, helped finance "man's" first flight. Katherine contributed to their scientific pool of knowledge and to their bank account through their struggle to conquer flight. Almost every historian credits her with using the money she earned teaching Latin and Greek to purchase the materials for their fragile airplanes[6].

Ever since that infamous day, women have also been caught up in the "spirit of flight"; unfortunately, few women had the economic means or society's approval of furthering their interest in this area. Influential persons in aviation were aware of women's efforts and accomplishments and could have helped to expand the roles of women in aviation, but they were surprisingly restrictive in their views. For example, Eddie Rickenbacker took the executives of Boeing to task in 1930 for hiring the first female flight attendants. He argued that flying was a man's occupation and should stay that way[7].

1903-1918

Orville Wright rejected all female applicants on the grounds they were notoriety seekers. An early rival of the Wright Brothers, Glen Curtiss, had to be coaxed to accept a female flight student. However, he then "fixed" the airplane so it would not obtain enough power to fly and restricted his student, Blanche Stuart Scott, to ground school classes and taxi tests. Scott

[3] Marian Gyr, "Book Review of Pioneer Airwomen," *Women in Aviation: The Publication* (May-June 1990).
[4] Marian Gyr, 1990.
[5] Henry M. Holden and Captain L. Griffith, *Ladybirds: The Untold Story of Women Pilots in America*, revised 2nd printing ed. (Mt. Freedom, NJ: Black Hawk Publishing Co., 1992).
[6] Henry M. Holden and Captain L. Griffith, 1992
[7] Henry M. Holden and Captain L. Griffith, 1992

persevered, however, and in 1910, with the help of a mechanic on the field, she became the first American woman to solo an airplane[8].

American women were not alone in their battle against men for the right to fly. In 1911, Germany's first woman aviatrix, Melli Beese, discovered that her male colleagues had tampered with her plane's steering mechanism and had drained gas from the fuel tank. When questioned why, one of the men replied that "for a woman to fly would take the glory away from us"[9].

On July 24, 1912, Katherine Stinson became the fourth and youngest (age16) woman in the U.S. to earn a pilot's license. In May, 1915, at 17, her sister, Majorie became the first woman authorized to fly the experimental airmail service; it was unofficial and little mention is found in history books. The Post Office did not restart airmail service until 1918. The Stinson sisters started a flying school in San Antonio, Texas; they taught their brothers, Eddie and Jack, to fly. Eddie, first a test pilot, later founded the Stinson Aircraft Co.[10].

Because men controlled the economy and the money, they dominated the new sport of flying. Elitism soon prevailed and women were considered not physically fit to become pilots. This, however, did not discourage all women from learning to fly; even movie actresses got into the act. The majority of women who entered the aviation arena did so for the thrill, for the fun of flying. However, women who desired a career in aviation were very serious about educating the public about the safety and efficiency of flight[11].

1919-1929

Many who entered aviation in the 1920s were drawn by the romance and excitement of flying, only to find out that there was far more hard work than time for fun. For most pilots, commercial aviation was a tenuous way to make a living. As the novelty wore off, many returned to their former, more traditional lifestyles[12].

The challenges that confronted women pilots in the 1920s are faced by all women entering a field that is generally considered a masculine domain. Despite the odds against them, women of that era made great contributions to the development of aviation. From the beginning, women have been an integral part of aviation's progress. The attitude that flying was socially inappropriate and even physically impossible for women was common. To overcome the prejudice, women took to the skies first as passengers before assuming a more visible role as pilots, thereby demonstrating the relative ease and safety of air travel.

By World War I, 11 women had earned their pilot's licenses and countless others were flying without one. Although the U.S. government refused to allow them to fly in combat, women put their flying skills to use during the war by making fund-raising flights for the Red

[8] Peggy Baty, "Those Wonderful Women and Their Flying Machines," *Women In Aviation: The Publication* 1, no. 2 (May-June 1989).
[9] Peggy Baty, 1989.
[10] Henry M. Holden and Captain L. Griffith, *Ladybirds: The Untold Story of Women Pilots in America*, revised 2nd printing ed. (Mt. Freedom, NJ: Black Hawk Publishing Co., 1992).
[11] Kathleen Brooks-Pazmany, *United States Women in Aviation 1919-1929* (Washington and London: Smithsonian Institution Press, 1991)
[12] Kathleen Brooks-Pazmany, 1991

Cross and Liberty Loans and by lending their names to the recruiting effort[13]. By the end of the decade, women pilots had helped to bring the airplane before the public as a practical mode of transportation and a wonderful new form of recreation.

When civilian flying was curtailed during WWI in the United States, women pilots found diverse ways to stay active in aviation. They took jobs such as aeronautical draftsmen for the U.S. Navy Department, expeditors for the British Air Ministry, etc. After the war, when flying was again open to civilians, there was great competition for aviation-related jobs. For women, barnstorming was often the only means of access to a career in aviation. Many times, they began as wing walkers and parachutists. Some formed flying troupes, flying schools, engaged in demonstration flying and other aviation-related businesses—anything in order to stay in the aviation field[14].

One of the problems a woman had to face on the barnstorming circuit was lonesomeness. Other problems included public opinion and political pressure; both of these had a great impact on the success or failure of a woman's aerial career. After any accident involving a woman, there was usually a public outcry to restrict women from the flying arena.

During the years after WWI, women had a considerable influence in changing flying from a novelty to a lucrative commercial industry. Anytime a woman boarded an airplane, it made news. Both the industry and the individuals were quick to capitalize on the press's eagerness to publicize the women in aviation. Taking an airplane flight or buying a plane was a sure way to put a Hollywood starlet's name in bold print. Women also attracted attention for personal causes through air travel[15].

Recognizing the persuasive value of women seen using their products, manufacturers featured them in advertisements from everything from goggles to oil to parachutes. Manufacturers also sought endorsements of the aircraft women pilots flew. These endorsements often evolved into full-time paying positions as demonstrators or sales representatives[16].

Realizing the power of the written word, women wrote about aviation, lauding the delights of flying and arguing the case for women's right to fly. Many female journalists used the press as a medium to promote air-mindedness and the development of commercial aviation. Other women were zealous supporters of American aviation; they lobbied in Congress for the cause of women in aviation[17].

Between the wars, women continued to make inroads in aviation. Bessie Coleman, the world's first black licensed pilot, overcame both sexual and racial barriers. Because she could not persuade anyone in the United States to teach her to fly, she traveled to France in order to

[13] "Those Magnificent Women in Their Flying Machines," *Modern Secretary*, July 1985.
[14,] Kathleen Brooks-Pazmany, *United States Women in Aviation 1919-1929* (Washington and London: Smithsonian Institution Press, 1991.
[15] Kathleen Brooks-Pazmany, 1991.

take flying lessons. She returned to the U.S. with her Federation Aeronautique Internationale (FAI)[18].

Most women who flew were only interested in flying for recreation; however, there were numerous women who viewed aviation as a new, uncharted field. It was not unusual for a woman to go into business for herself, including flight instruction, carrying passengers for hire, operating airfields across the country, etc. However, in these enterprises, women did not attract much national attention. To gain national prominence and make a name for herself, a woman needed to set and break speed, distance, and altitude records. Because the FAI/NAA (National Aeronautics Association) had no separate category for women, their first efforts went unrecorded and unacknowledged by this regulatory body[19].

As the ranks of women pilots slowly grew, they became a force in many areas of aviation, including air racing and setting and breaking world records. In 1929, women were allowed to compete in a national aviation event—the National Women's Air Derby. This was the chance for women to prove they were competent, professional pilots. Although women had been active in many aspects of flying (exhibition, sport, transport, sales, and record setting), one area remained to be tackled—racing. Racing was the dramatic and visible way for pilots to demonstrate their abilities. The 1929 National Women's Air Derby brought women pilots together from all across the country and a new organization was born—"the ninety-nines." Its first president was Amelia Earhart. By competing in this Derby, the women pilots had provided the industry with another forum through which to test state-of-the-art aircraft[20]. Women pilots in the 1920s were dedicated to establishing their credibility. These pilots were a significant force for the progress of aviation. They were among the most daring of barnstormers. They strove to promote the flying as a safe and convenient way to travel. They tested and demonstrated new planes; they carried passengers and gave flying lessons; they set new records, they raced, they established a category for women's records, they founded their own pilot's organization. By their active participation, women helped aviation come of age in America. Their contributions helped to bring aviation into its present place as a vital industry in modern society[21].

1930-1939

The 1930s marked a positive change for aviation and women. Amelia Earhart defined for the decade what women were trying to prove by their flying: flying is safe and women make good pilots. Women wrote articles and gave speeches on the safety, convenience, and luxury of air travel. They worked, along with men, as promoters and participants in the fast-paced new field

[16]Kathleen Brooks-Pazmany, *United States Women in Aviation 1919-1929* (Washington and London: Smithsonian Institution Press, 1991).
[17] Kathleen Brooks-Pazmany, 1991).
[18] Kathleen Brooks-Pazmany, 1991).
[19] Kathleen Brooks-Pazmany, 1991).
[20] "Those Magnificent Women in Their Flying Machines," *Modern Secretary*, July 1985.
[21] Kathleen Brooks-Pazmany, 1991).

of aviation. There were approximately 200 licensed women pilots in the United States in 1930. By 1935, that number had grown to between 700 and 800[22].

Women entered the highly competitive spheres of air racing and commercial air travel. Leading women pilots took part in the development of commercial air travel. They also began to compete with men in major air races. In 1936, just one year after women were allowed to enter the transcontinental Bendix Race, women took both first and second place honors[23]. During this decade, women were also hired to fly on commercial flights as stewardesses. On May 15, 1930, the first group of eight stewardesses began service from Chicago in a Boeing 80A transport, westbound on a 20-hour, 13-stop route to San Francisco. A few of the stewardesses' jobs including demonstrating to people that flying was safe, serving passengers, assisting in refueling the aircraft, transferring baggage, mopping the cabin floors, and checking bolts to ensure that all seats were securely fastened to the floor[24].

Many women were involved in the furthering of aviation safety and visibility. Unfortunately, the history books generally do not relate these women's stories to any degree. Nonetheless, women made significant inroads during the infancy of aviation. They found various ways of making money in order to fly; some became barnstormers, stunt pilots, wing walkers, and acrobatics. Women became instructors, they worked with the federal government in various aspects of aviation, they became spokespersons for various aircraft manufacturers, they founded flying organizations for mercy missions, they participated in races. The most oft heard aviatrix was, of course, Amelia Earhart. Amelia had many accomplishments; in addition to flying solo across the Atlantic, she was the first person to fly solo from Hawaii to the U.S. mainland in January, 1935. Before her disappearance during her around-the-world attempt, Earhart actively promoted aviation as an industry and acted as a role model for thousands of young women[25]. She was also active in aviation research and served as an advisor in aeronautics at Purdue University[26].

Another famous woman pilot was Jacqueline Cochran; she set numerous altitude and speed records by 1939, after only five years of flying. Her total career record in aviation has never been equaled by any other pilot. Cochran wanted to form a women's Air Corps Auxiliary at the start of WWII; however, this fell on deaf ears. There was no way women would be allowed to fly for the military during that time in history[27].

Helen Richey was the first woman hired as co-pilot on the Pennsylvania Air Lines in 1935. However, bitter objections by male pilots forced the airline to fire her even though she had more experience than other men applying for the job.

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[22] Claudia M. Oakes, *United States Women in Aviation 1930-1939* (Washington and London: Smithsonian Institution Press, 1991).
[23] "Those Magnificent Women in Their Flying Machines," *Modern Secretary*, July 1985.
[24] Claudia M. Oakes, *United States Women in Aviation 1930-1939* (Washington and London: Smithsonian Institution Press, 1991).
[25] "Those Magnificent Women in Their Flying Machines," *Modern Secretary*, July 1985.
[26] Nancy Samuelson, "Equality in the Cockpit," *Air University Review* 35 (May-June 1984).
[27] "Those Magnificent Women in Their Flying Machines," *Modern Secretary*, July 1985.

Activities such as barnstorming, wing walking, flying circuses, and parachute jumping allowed women to use entertainment and showmanship to attract crowds, earn money, and keep flying. However, the bias against women as serious aviators may have increased as they became more and more a part of recreational and stunt flying[28].

One of the barriers to women who wanted to fly was money. Only one out of seven American women worked outside the home; their average income was $850 a year. In addition to this financial barrier, there was a more basic feeling of fear which held women back. Society taught most women not to be courageous; women were supposed to rely on men for protection and provision[29].

Early women in aviation were glamorized by the media; most however, achieved their reputations through hard work, determination, and successful competition. Unfortunately, these traits were seen as "unladylike." Flying was still considered a male pursuit, and women who took it up either for recreation or as a career were often labeled "tomboys." It was "unnatural;" women pilots were not "keeping their place." Women in aviation threatened the comfortable illusions about their "limited capabilities"[30].

Most of the early female aviators, aware that their very presence in planes was crossing gender barriers, flew in long skirts and feminine hats, even though the unpressurized airplanes were extremely cold. In contrast, Amelia Earhart wore comfortable, old flying clothes. When it was cold, she wore a heavy flying suit just like male pilots. Interestingly, this outfit made Earhart immediately recognized as a pilot and obeyed by ground crews. Again, this was seen as "unladylike;" instead of viewing her as a female Charles Lindbergh in drag. Perceiving Earhart as a male transvestite was easier for some people than having to consider the implications of a woman soloing across the Atlantic[31].

Starting in the 20s and 30s, the aviation industry sought to convert public attitudes about flying and safety through advertisements featuring women[32]. In the 1930s, women became involved in selling aircraft instruments, contacting prospective buyers, demonstrating aircraft performance, giving talks on aviation, picking up new airplanes at the factories, charter flying, instructing, running their own charter services, helping to popularize air mail. Women pilots established an "Air Marking Program," whereby each state took part in a program to better identify its towns and cities from the air[33].

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[28] Luanne Lea, "Women, Aviation and the American Dream," in *Images of Women in Aviation: Fact vs. Fiction Conference* (Prescott, Arizona, 1990).
[29] Susan J. House, "Women in Air Traffic control - On the Other Side of the Radio," in *Images of Women in Aviation: Fact vs. Fiction Conference* (Prescott, Arizona, 1990).
[30]Luanne Lea, "Women, Aviation and the American Dream," in *Images of Women in Aviation: Fact vs. Fiction Conference* (Prescott, Arizona, 1990).
[31]Karla Jay, "No Bumps, No Excrescences: Amelia Earhart's Failed Flight Into the Fashions," in *Proceedings of the Second Annual National Conference on Women in Aviation* (St. Louis, MO, 1991).
[32]Luanne Lea, "Women, Aviation and the American Dream," in *Images of Women in Aviation: Fact vs. Fiction Conference* (Prescott, Arizona, 1990).
[33] Claudia M. Oakes, *United States Women in Aviation 1930-1939* (Washington and London: Smithsonian Institution Press, 1991).

According to Louise Thaden, a prominent and respected woman pilot of the day, aviation in the 1930s was the "first time women began to be accepted on their own merits as pilots. It was a time of growth and exploration, when all 'firsts' were really firsts"[34].

1940-1945

By the outbreak of World War II, much had changed for aviation and women pilots. Air travel was a much more commonplace mode of transportation. Manufacturers and aircraft sales companies no longer felt the need to continue hiring women as demonstration pilots and saleswomen because most of the novelty and the fear were gone from private flying. Since the glamour and excitement of the air races had dimmed, women could no longer count on winning races as a means to making names for themselves in aviation[35].

By making aviation tamer and more acceptable, women had, ironically, closed career doors they had previously followed toward fame in aviation. Women were being taken more seriously as good, professional pilots. But at the same time, they had worked themselves out of the limelight and, in many cases, out of a job. Women pilots were no longer a novelty. This was not to say there was smooth sailing for women in aviation, but, for the most part, women had accomplished their goals of helping make air travel a standard means of transportation and had proven to the world that women could be competent pilots[36].

The early women of aviation sought to educate the public about the safety of aviation and to promote the aviation industry. They did this in a variety of ways, from speaking engagements to writing to flying itself. Although women have not been as visible in the collegiate environment as men, they have been involved in aviation education in many diverse ways. Socialites, starlets, deaf women, recreational and serious aviatrixes all helped to define the world of aviation for America, as well as for the world. Although they were not part of the collegiate world, their presence was felt throughout the industry.

There were many "firsts" during the years of World War II. Everyone recognizes the contributions of "Rosie the Riveter" during the war whereby women stepped in to take over jobs of men in the aircraft plants when men went off to war. After the war, of course, the women were supposed to give up their jobs and return home as full-time housewives and mothers. There were many more contributions women made during this time in the area of aviation—contributions that were never publicized in any great detail. Although women trained as civilian and military pilots since WWI, in 1940, Helen Richey was the first woman to be licensed by the newly-formed Civil Aeronautics Authority. The WACs—Women's Army Corps—took over jobs from men who could perform Army Combat duties, e.g., women worked as aircraft

[34] Claudia M. Oakes, *United States Women in Aviation 1930-1939* (Washington and London: Smithsonian Institution Press, 1991), p.11.
[35] Claudia M. Oakes, *United States Women in Aviation 1930-1939* (Washington and London: Smithsonian Institution Press, 1991).
[36] Claudia M. Oakes, *United States Women in Aviation 1930-1939* (Washington and London: Smithsonian Institution Press, 1991).

mechanics, parachute riggers, welders, instrument technicians, electricians, aerial photographers, radio technicians, radio-control tower operators, weather observers, etc. The WAVES—Women Accepted for Volunteer Emergency Service—were involved with jobs for the Navy. The "Army Nurse Corps" transported women closest to the front lines; they provided air-evacuation service[37]. In 1941, Jacqueline Cochran copiloted an Air Force bomber to England. In September, 1942, Stephen's College in Columbia, Missouri, became the first school to offer women a course in aviation[38].

The flyers of the Women Air Force Service Pilots (WASP) of WWII were pioneers, the first licensed women pilots in the U.S. to fly military airplanes for military service. The WASP was formed in August, 1943, from two earlier, relatively independent programs for women pilots: the Women's Auxiliary Ferrying Squadron (WAFS), an experimental squadron of experienced women pilots employed to ferry aircraft for the Air Transport Command, and the Women's Flying Training Detachment (WFTD), a training program established to supply pilots for the squadron. Thirty-eight Women Air Force Service Pilots lost their lives flying for their country in the Army Air Force during WWII. On December 20, 1944, the WASP program was deactivated. The WASPs' lives as military pilots abruptly ended and they returned to civilian life with no veterans' benefits[39].

Jackie Cochran's "girls" of the WASP made a revolutionary statement about the physical and mental capabilities of women—even if the government would keep the information buried in classified files for thirty years. WASP had proven that bright, healthy American girls could learn to fly the army way just like their brothers[40].

Ruth Woods, one of the WASPs who continued flying long after the end of the program, thought the women of the WASPs "…opened the door for the present women in the Air Force and other women in aviation. We opened that door so that they would be accepted and not sneered at. We laid the groundwork. We followed behind people like Amelia Earhart, who were loners. We came in as a body, a group—any group can exert a lot more pressure than a single individual. I personally feel that was our greatest accomplishment"[41].

In 1977, the government finally approved a "WASP" amendment to the G.I. Bill Improvement Act of 1977, which granted the WASP full military status and made them eligible for veterans' benefits—32 years after they had been deactivated and sentenced to obscurity[42].

In 1943, the first women were trained as air traffic controllers for the Civil Aviation Administration due to a shortage of men. After the war, they were replaced by men, and it was not until several decades afterward that women were again admitted to the control tower[43].

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[37] Charles Paul May, *Women in Aeronautics* (New York: Thomas Nelson & Sons, 1962).
[38]Elizabeth Simpson Smith, *Breakthrough: Women in Aviation* (New York: Walker and Company, 1981).
[39]Anne Noggle, *For God, Country and the Thrill of It: Women Air force Service Pilots in World War II* (College Station: Texas A&M University Press, 1990).
[40] Marianne Verges, *On Silver Wings: The Women Air force Service Pilots of World War II 1942-1944* (New York: Ballatine Books, 1991).
[41] Jean Hascall Cole, *Women Pilots of World War II* (Salt lake City: University of Utah Press, 1992).
[42] Marianne Verges, *On Silver Wings: The Women Air force Service Pilots of World War II 1942-1944* (New York: Ballatine Books, 1991).

1945-1965

From their unselfish efforts (with the war effort, etc.), women earned genuine but distant respect from some men. Women pilots were viewed as being either a small and strange minority or as trouble-makers trying to upset the status quo. Hidden behind almost every objection voiced by men was this last fear. An upset in the male aviation community would have grave economic and social consequences; women would steal jobs and gain power[44].

About 25,000 women worked in the aircraft industry during WWII. After the war, all forward motion for women in the direction of progress came to a stop. Women were directed to return to their homes and husbands, freeing up jobs for returning male veterans. But there had been progress[45].

In 1953, Jacqueline Cochran became the first woman to break the sound barrier. The "Whirly-Girls" started in 1955; this is an international organization of women helicopter pilots that provides a support network for women who fly helicopters. In August, 1991, there were 781 Whirly-Girls from 26 countries[46].

1965-1980

In 1966, Ensign Gale Ann Gordon became the first woman to solo in a Navy training plane. In 1970, the first women were admitted to U.S. Air Force Officers Training School and, in 1973, the first class of eight women began pilot training with the U.S. Navy. Also in 1973, Emily Warner, as copilot with Frontier, became the first American woman in modern times to fly for a scheduled airline. In 1976, women were admitted to U.S. Air Force Academy and to the U.S. Navy Aviation Officer Candidate School at Pensacola, Florida[47].

Space Program

The space race began October 4, 1957, when the Soviet Union launched the first man-made satellite, Sputnik I, into space. From the women's point of view, the race was won by the Russians on June 16, 1963, when Valentina Tereshkova became the first woman in space. It would take fifteen years before the United States to even considered choosing women to enter space. However, in 1960, Jerrie Cobb became the first woman to pass the tests for being an astronaut. She was so successful in passing the tests, twenty-four other women were solicited to suffer through the same examinations. In spite of outstanding results, these women were never utilized as astronauts; in fact, almost two decades passed before women were considered more seriously for the space program[48].

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[43] Elizabeth Simpson Smith, *Breakthrough: Women in Aviation* (New York: Walker and Company, 1981).
[44]Henry M. Holden and Captain L. Griffith, *Ladybirds: The Untold Story of Women Pilots in America*, revised 2nd printing ed. (Mt. Freedom, NJ: Black Hawk Publishing Co., 1992).
[45] Henry M. Holden and Captain L. Griffith, 1992.
[46] Henry M. Holden and Captain L. Griffith 1992.
[47]Elizabeth Simpson Smith, *Breakthrough: Women in Aviation* (New York: Walker and Company, 1981).
[48] Hodgman, 1981.

By 1976, scattered studies indicated that women "appear equal to men for space flight," and increasing evidence pointed to the conclusion that women may be more suitable than men for some missions. The tests on women in the 1960s by NASA had drawn correct conclusions—women were equal and in some cases better equipped to handle space flight than men[49].

In January, 1978, NASA selected thirty-five astronaut candidates for its space shuttle program; six were women: Dr. Shannon Lucid, a biochemist; Dr. Anna Fisher, a physician; Dr. Judith Resnik, an electrical engineer; Sally Ride, a physics research assistant; Dr. Margaret Rhea Seddon, a surgical resident; and Kathryn Sullivan, a doctoral candidate in geology. All six women were picked to be mission specialists, which means that although they would not pilot the shuttle, they would take part in medical, engineering, scientific duties, and space walking[50].

It was June 18, 1983, when Dr. Sally K. Ride became America's first woman astronaut to make it into space. Ride became a model for women to look up to when she became an astronaut. In October, 1984, Kathryn Sullivan became the first American woman to space walk. Anna Fisher was the first mother to fly in space in November, 1984. Christa McAuliffe, chosen to be the first teacher in space, symbolized the chance that ordinary people, not just Ph.D.s or pilots, could go into space. Mae Jemison, who joined NASA in 1987, was the first black female astronaut[51].

According to Briggs, both the Soviets and the Americans have discovered a benefit to including women astronauts in their space programs. They contend that the whole work atmosphere and mood in a crew of men and women are better than men-only environments. "Somehow, the women elevate relationships in a small team, and this helps to stimulate its capacity for work"[52]. Every group of astronauts chosen since 1977 has included women and there is no reason to expect this to change. Whether one is female or male is no longer important to NASA.

1981-1993

By 1983, the number of women flying for the airlines had grown to just over 200, and by 1992, that number had grown to 1200 women flying for American commercial airlines and about 600 military pilots[53].

Not all women associated with jets are interested in flying them. Olive Ann Beech of Waverly, Kansas, does not pilot her own plane, yet she is one of the best known women in aviation today. She was president of Beech Aircraft Corporation; she became president in 1950 when Walter H. Beech died. Under her leadership, Beech Aircraft has formed a corporation that carries on research on secret projects, especially those related to missile development. Beech

[49] Henry M. Holden and Captain L. Griffith, *Ladybirds: The Untold Story of Women Pilots in America*, revised 2nd printing ed. (Mt. Freedom, NJ: Black Hawk Publishing Co., 1992).
[50] Hodgman, 1981.
[51] Briggs, 1988.
[52] Briggs, 1988
[53] Henry M. Holden and Captain L. Griffith, *Ladybirds: The Untold Story of Women Pilots in America*, revised 2nd printing ed. (Mt. Freedom, NJ: Black Hawk Publishing Co., 1992).

Aircraft has also pioneered development of small jets to serve as traveling planes for military personnel[54].

The Ninety-Nines have become an impressive organization in furthering women's commercial interest in aviation. It serves as a network and inspiration for women to write articles on aviation and fosters a sense of air-mindedness. The Ninety-Nines address civic clubs, schools, and governmental institutions, taking their knowledge and love of aviation to the community-at-large.

Today, the Ninety-Nines number more than 7000 member in nine countries. In 1979, when the Ninety-Nines celebrated their Golden Jubilee, Air Force General (and Senator) Barry Goldwater hailed, "…the great accomplishments of women pilots throughout the last half century, particularly the lasting contribution they made to the development of aerospace pursuits." His words were proof of what Amelia Earhart had said fifty years earlier, "If enough of us keep trying, we'll get someplace"[55].

There are increasingly open avenues for women seeking careers in aviation today. These include careers as cargo pilots, aviation inspectors, corporate pilots, air traffic controllers, aeronautical engineers, boom operators, flight engineers, and astronauts[56].

Nowadays, Navy women routinely fly the mail to aircraft carriers and deliver food and weapons to ships all over the world. They dogfight, test new missile systems, and serve as flight instructors. Women flight students are now a common sight in Pensacola. In 1990, there were 12,477 Navy pilots, 225 of whom were women[57].

In general, service policies are more restrictive than the laws themselves. While it is possible for women to attain equal opportunity, these laws and policies prevent them from acquiring the necessary experience to compete for the high level operational commands that are the pinnacle of a military career. It is impossible for a woman to even remotely qualify for the top job in the Navy—Chief of Naval Operations. Women have a better shot at becoming Secretary of the Navy. According to some women Navy pilots, "No matter her ability, the determining factor in a military career is still her sex. There can be no such thing as equal opportunity until the combat laws are removed"[58].

However, Anna Fisher, astronaut, reported that she found less discrimination as an astronaut at NASA than she found in the medical profession[59]. On April 28, 1993, the Department of Defense announced that the ban on women combat pilots was lifted[60]. It will be interesting to see what, if any, effect this will have on women's opportunities in the military and in aviation, in general.

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[54] Charles Paul May, *Women in Aeronautics* (New York: Thomas Nelson & Sons, 1962).
[55]Henry M. Holden and Captain L. Griffith, *Ladybirds: The Untold Story of Women Pilots in America*, revised 2nd printing ed. (Mt. Freedom, NJ: Black Hawk Publishing Co., 1992).
[56]Elizabeth Simpson Smith, *Breakthrough: Women in Aviation* (New York: Walker and Company, 1981).
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[58] Henry M. Holden and Captain L. Griffith, 1992.
[59]Hodgman, 1981
[60]"Women in Combat", 1993

Conclusion

This analysis has barely touched on the key contributions early aviatrixes made to aviation; there are many, many names of early women pilots and aviation educators not listed here. Women made invaluable contributions to aviation during WWII and beyond that are not within the scope of this review; however, some of these data are available in a dissertation cited in the references[61]. It is vital that the message about these courageous early pioneers be disseminated in all arenas, but especially in our schools and colleges.

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